

far enough to form the mouth, but certainly not sufficiently to form the mentum. Still later, and also upon the back, the cloaca will be formed by an invagination of the ectoderm; and this, although very long in the adult, is still very short in the larva, and remains reduced to a simple emargination in the *Floscularie*. The cephalic region is soon bounded by a slight fold, which indicates the margin of the chitinous covering. The eyes make their appearance as two red points; cilia begin to move, at first upon the infrabuccal pit, then upon the mouth, and finally upon the top of the head, where they form a sort of circle. The armature of the mastax is formed, the tail withdraws by degrees towards the extremity of the egg, the envelope of which it finally ruptures. It has already been described by several authors; and I shall dwell only upon this fact, that, like the larva of *Lacimularia* figured by Huxley, it presents cilia upon three points of the body—a continuous and scarcely sinuous circle placed above the mouth, a second circle surrounding this circle and the mouth, and extending even over the vibratile pit, and, lastly, a tuft of cilia at the extremity of the tail. The larva remains active for several hours, and then attaches itself by means of the glands contained in its tail. It is then that it begins to collect in the vibratile pit the minute particles suspended in the water. These it mixes with the secretion from a gland, hitherto taken for a ganglion, and, according to the judicious observations of Gosse and Williamson, forms of them those little balls which, when juxtaposed, constitute the tube that it inhabits.—*Comptes Rendus*, November 21, 1881, p. 856.

On a Yellow Variety of the Common Eel (Anguilla vulgaris, Fl.).
By Dr. HEINRICH BOLAN, of Hamburg.

On the 2nd July, 1879, a very interesting, pure sulphur-yellow variety of our river-eel, which had been taken in the Elbe near Hamburg, was brought to me for the aquarium of our Zoological Garden here. This first example was followed by thirteen other similar ones in the interval between the 4th September and the 9th October of the same year. In the summer of the present year (1880) the occurrence of the yellow eels in the Elbe was repeated. On the 5th May I received two specimens, and then gradually, up to the 13th August, seven others.

Only the eel first captured, which is still living in the aquarium, is pure yellow without black spots. It is about 32 centim. (13 inches) long. Its upper surface and sides are of a beautiful light lemon-yellow; the muzzle is rather more orange-coloured. In the hinder half of the body, and especially the tail, there are on the sides numerous whitish spots in the yellow. The whole underside is whitish and shining, while the yellow parts of the body are dull. The fins are pale yellow and so translucent that the finer blood-vessels may be detected in them with the naked eye; in the same way the blood shows reddish through the skin on the whitish lower

jaw; and at the base of the tail, below the vertebral column, the pulsating movement of the blood passing from behind forwards in the subcaudal veins can be distinctly recognized.

The eyes of our animal are smaller than in the normal state, and therefore appear rudimentary. They are reddish violet; their background is without pigment, so that it appears red; on the other hand, dark pigment exists in an equatorial zone (taking the normal axis of the eye as axial): of course, however, these conditions cannot be ascertained with perfect certainty in the living animal.

As the yellow colour of this eel has remained unaltered to the present time (20th September, 1880) we have in it an example of the very rare case of leucæthiopism in a fish. Although the other yellow eels were at the first glance very like the one just described, they have proved very different from it in their whole behaviour. All had black spots upon a lighter or darker ground, and these spots were distributed either only upon the upper part of the head, or also over parts of the back. The eyes were always normal. In size the animals did not essentially differ from the first-mentioned eel.

The thirteen animals of this kind received by our aquarium in the course of the year 1879 all changed their colour by the winter; they gradually became darker and darker, until at last they had acquired the coloration of normal eels. This is the more remarkable as there were among them animals which, with the exception of the blackened head, were perfectly pure yellow, exactly like the above-described albino. The nine eels received by our aquarium this summer (1880) were likewise spotted with black upon a yellow ground. As yet they have not changed colour.

Similar yellow black-spotted eels have been observed several times besides the present cases. In the literature of the subject I find only one case. Brandt (*Bull. de l'Acad. de St. Pétersb.* vol. x. 1852, p. 13) and von Siebold (*Süsswasserfische von Mitteleuropa*, p. 19, note) mention an eel presented by Dem. Taglioni to the Paris Museum, which was pale brownish yellow (nankeen-yellow) and normally coloured only at the extremities of the nose and tail. The colour of the eyes is not stated in the description given by Meunier (in *D'Orbigny's Dictionnaire d'Hist. Nat.* tome i. 1841, p. 249). Brandt calls this the only example of a leucotic fish.

According to an oral communication, Prof. Möbius, of Kiel, received a similar female eel, fully $\frac{1}{2}$ metre long, on the 29th May, 1868; the animal had normal eyes.

According to a report in the public papers another eel of the kind was recently taken in a piece of water to the south-east of Bremen. In answer to a letter of inquiry addressed to the [former] possessors, MM. F. Klevenhusen & Co., of Bremen, those gentlemen have given me the following information about this fish:—The eel was exactly the colour of a goldfish and had black eyes; it had four or five black spots in the neighbourhood of the head; the belly also was darker than the back, so that in water it appeared as if the eel was lying on its back. The animal has been presented to the Bremen Museum; in spirit it has lost its red colour and become yellow.

Further, as regards the occurrence of leucotic fishes, Brandt, in the memoir above cited, describes a sterlet (*Acipenser ruthenus*), one foot in length, which was kept in the basin of the fountain of the Winter Garden at St. Petersburg, and had been brought there from Nischnij-Novgorod. With the exception of an inner silvery border, the iris was destitute of black pigment, so that the eye in front appeared for the most part veined with red, in consequence of the vessels shining through. With the exception of the very light pale grey fins, the ground-colour of the fish was pale brownish orange, with a flesh-coloured tinge on the sides and belly, while the somewhat darker dorsal surface had a yellow tinge.

Siebold (*l. c.* p. 18) mentions a loach (*Cobitis barbatula*) of a pale reddish colour and with a red pupil, which he found in the fish-market at Munich; and in the same place he cites Baldner, who describes a white burbot (*Lota vulgaris*) and a pale loach (*Cobitis barbatula*). These are the few examples of leucathropism that are known to me.

Consequently the occurrence of an albino eel (such as that above mentioned), as well as such an abundant appearance of yellow eels with black spots, have been previously unknown.—*Archiv für Naturgeschichte*, Jahrg. 47 (1881), p. 136.

On the Origin of the Central Nervous System of the Annelida.

By Prof. KLEINENBERG.

The author gives a summary of the results obtained by him in studying the development of the Polychæta, upon which he proposes hereafter to publish a more extended memoir with figures. At present he confines himself to making known the development of a single species, the larva of *Lopadorhynchus*, until its transformation into the perfect animal.

The most interesting point in the present communication is the discovery of the circular nerve of the vibratile organ of the larva, and the investigation of the development of the central nervous system of the perfect animal. The author has found that during the transformation of the larva into the perfect animal the circular nerve disappears completely, together with the vibratile organ; and the rudiments of the typical central organs are not derived from the transformation of the circular nerve, but originate from other parts of the ectoderm. Consequently the nervous system of an Annelid is not homologous with that of its larva. Kleinenberg thinks that the larvæ of the Annelida possess only the central anterior nervous system of the Cœlenterata, but that the perfect animals have central organs proper to them; so that "the organ of the inferior type originates and functions in the larva, but is eliminated and replaced by new formations in the adult animal."—*Atti della R. Accad. dei Lincei, Transunti*, vol. vi. p. 15, 1881.